

REMARKS:

This reply encompasses a bona fide attempt to overcome the objections and rejections raised by the Examiner and presents the reasons why the Applicants believe the rejections should be withdrawn. An automatic two-month extension of time is requested. The requisite fee per CFR 1.17 is enclosed.

Detailed Action / Drawings

The Applicants have submitted a clean version of **Fig. 6B** correcting the incorrect superscript position.

Detailed Action / 35 USC §112 rejections

In this Office Action, the Examiner rejected claims **12** as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regards as the invention. Claim **12** was rejected as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. The omitted element was a saturable absorber layer. In this reply, claim **12** has been amended to include a saturable absorber layer as a limitation. Removal of this ground for rejection is requested.

Detailed Action / 35 USC §103 rejection

In this Office Action, the Examiner rejected claims **1-4, 9-10, 22, 25-27** and **34-35** under 35 U.S.C. 103(a) as being unpatentable over Knox (US 5,627,854). The Examiner argued that Knox disclosed the limitations in these claims with the exception of a modified first surface of the substrate such that an etalon is formed between the reflector and said first surface of the substrate. The Examiner further argued that it is well known in the art that a surface of a substrate is often a modified surface. For example, the Examiner indicated that a substrate is often cleaved, polished, coated with a metal or dielectric, or modified in any number of other ways during the basic fabrication of a device. The Examiner concluded that such a modification would affect this modified surface in such a manner so that an etalon would be formed between the reflector and the modified surface and that it would therefore have been obvious to one skilled in the art to modify the surface of the substrate in such a manner.

On p. 3, line 6 in the specification of this application, the Applicants concur with the Examiner's assertion that sometimes substrates have polished back surfaces. However, in the paragraph starting on p. 2, line 30 in the specification of this application, the Applicants indicate that interference or etalon effects associated with reflections from front and back surfaces of the substrate affect the laser operation and are either ignored, because the front surface is more reflective than the back surface, i.e., the interference is negligible, or are

detrimental to the laser operation. On p. 3, line 7 in the specification of this application, the Applicants note that when the effect is not negligible, “the prior art removed the effect by sanding the back surface to roughen it.” To further support the Applicants’ description of the state of the prior art, a supplemental IDS with a reference by C.J. Howle et al. (Proceedings of CLEO 1998, p. 161-162) is included in this reply, as well as payment for the supplemental IDS fee per 37 CFR 1.97. In the fourth paragraph, lines 9-16 of Howle et al., the authors note the detrimental multipulsing effect caused by the reflective back surface of the saturable Bragg reflector (SBR) and state “To alleviate this problem the back surface of the substrate was roughened using an abrasive cloth.” Finally, column 3, lines 13-16 of Knox also supports the Applicants’ description by noting that the Bragg reflector in the patent is “not an etalon or cavity reflector.” Thus, polishing or modification of the substrate in the manner the Examiner describes would either not produce an etalon, because the reflection or transmission of the materials is incorrect, or would be detrimental to the laser performance in the absence of the other limitations claimed by the Applicants. As such, the inadvertent etalon suggested by the Examiner teaches away from the invention claimed by the Applicants.

MPEP 2143.01 indicates that if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In addition, if a proposed modification or combination of prior art would change the principle of operation of the prior art invention being modified, then the teaching of the references are not sufficient to render the claims

prima facie obvious. Finally, MPEP 2143.02 indicates that there needs to be a reasonable expectation of success to reject claims as *prima facie* obvious. The disclosure of the Applicants' invention and the prior art indicate that this is not the case. It is the Applicants position, therefore, that the Examiner has not made a *prima facie* case for obviousness. The Examiner has the burden of showing evidence that such an inadvertent etalon would not be detrimental for the laser performance.

In spite of the preceding discussion, if one accepted the Examiner's reasoning for sake of argument, the asserted inadvertent etalon still would not achieve the features of the Applicants' invention. In particular, on p. 10, lines 19 and 21 in the specification of this application, the Applicants indicate that the back of the substrate needs to be polished to $1/4$ of the wavelength of light and preferably $1/8$ of the wavelength to achieve a free spectral range of 1 GHz or greater (p. 12, line 34 in the specification of this application). The Examiner has presented no factual evidence besides mere assertion that an inadvertent etalon produced by modifying a substrate by cleaving, polishing, coating with a metal or dielectric, or modified in any number of other ways during the basic fabrication of a device would achieve the required etalon performance. Claims, such as claim 1, which include the limitations of "an etalon comprising two opposing surfaces" and a "reflector and said modified surface form said two opposing surfaces of said etalon," are interpreted in light of the specification. Per MPEP 2143.03, to establish a *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. For this

reason, as well as that given previously, the Applicants believe that the Examiner has failed to establish a *prima facie* obviousness. Removal of this claim rejection is requested.

In this Office Action, the Examiner rejected claims **5-8, 11-21, 28-33** and **36** under U.S.C. 103(a) as being unpatentable over Knox in view of Weingarten et al. (US 6,393,035). For claims **5-8, 12, 16-18** and **28-31** the Examiner argued that Knox disclosed the limitations in these claims with the exception of a means for tuning the etalon effect. The Examiner indicated that Weingarten teaches a saturable reflector having portions that are temperature tuned. The Applicants hold that Weingarten et al teaches exciton tuning (see for example p. 16, lines 3-8 and p. 17, lines 8-28 in the specification of this application, as well as Figs. **3** and **5**). This is materially different than the Applicants' invention where etalon tuning is provided (claims **5, 16** and **28** contain limitations pertaining to the "tuning an etalon effect of the etalon"). Hence, the combination of Knox and Weingarten et al does not produce all of the claim limitations and the Examiner has, therefore, failed to establish *prima facie* obviousness. Removal of this ground for rejection is requested.

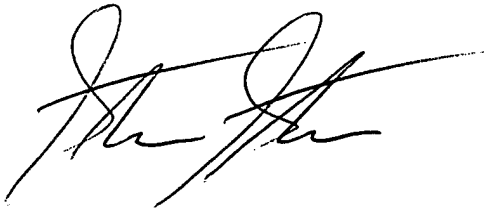
For claims **11, 13-15, 19-21, 32-33** and **36**, rejected based on Knox in light of Weingarten, the claims are dependant on independent claims and incorporate the limitations of those claims. The discussion presented above to obviate the rejection based on an implicit etalon in combination with Knox holds here as well. As such, the Examiner has not produced all the claim limitation and has, therefore, failed to establish *prima facie* obviousness. Removal of this ground for rejection is requested.

In this Office Action, the Examiner rejected claims **23-24** under 35 U.S.C. 103(a) as being unpatentable over Knox in view of Kortz et al. (US 5,848,079). These claims are dependant on independent claims and incorporate the limitations of those claims. The discussion presented above to obviate the rejection based on an implicit etalon in combination with Knox holds here as well. As such, the Examiner has not produced all the claim limitation and has, therefore, failed to establish *prima facie* obviousness. Removal of this ground for rejection is requested.

In Conclusion

The Applicants have responded to all of the Examiner's objections and rejections and thus respectfully request the application be reconsidered.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Dr. Stupp', with a long horizontal flourish extending to the right.

Dr. Steven Stupp

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